Pakistan Journal of Marine Sciences, Vol. 17(2), 99-106, 2008

OBSERVATIONS ON THE AVIFAUNA OF MIANI HOR, BALOCHISTAN

Fayyaz Rasool and Syed Ali Hasnain

Marine Environment Unit, Marine Pollution Control Department, Karachi Port Trust, Karachi, (FR); WWF-Pakistan, 606/607 Fortune Center, Block 6, PECHS, Shahrah-e-Faisal, Karachi-75400, (SAH);
E-mails: fayyaz19us@yahoo.com; ahasnain@wwf.org.pk.

ABSTRACT: Miani Hor, a Ramsar site, is an important coastal wetland along Arabian Sea. This is the only area on Pakistan coast where three species of mangroves grow naturally. This paper presents the observations on avian fauna recorded from the area during October 1997 to June 2002. The paper reports the occurrence of 70 species of birds belonging to 10 Orders and 27 Families from the area. Out of which 37 species are migratory. The preferred habitat of various species and their status has also been given.

KEYWORDS: Avifauna, Balochistan, Conservation, Ecoregion, Ramsar site.

INTRODUCTION

Pakistan harbors the largest arid climate mangrove forest of the world, 97 % of which occurs in the Indus Delta region and the remaining in the province of Balochistan. Mangroves are not merely a group of plants but rather coastal forest ecosystem of tropical and subtropical inter-tidal regions of the world (Hamilton and Snedaker, 1984). In the mangrove ecosystem, birds play a vital role being the most conspicuous component of the mangrove community while using it as feeding grounds, roosting and breeding areas.

Miani Hor (25° 31′ N, 66° 20′ E) is a lagoon situated about 90 km away from Karachi on the eastern most part of Balochistan coast (Fig. 1). The total area of the bay is 363 km^2 (Saifullah and Rasool, 2002) having 2500 ha of mangrove vegetation (Rasool *et. al.*, 2002) which comprises of three species *Avicennia marina*, *Ceriops tagal* and *Rhizophora mucronata*. This is the only area along Pakistan coastline where three species of mangrove exist naturally (Saifullah *et. al.*, 1999). Two ephemeral rivers, Porali and Winder, enter into the bay in the center and near its mouth respectively. The basin of the Porali River is 11,500 sq. km with a run off of 70 mm and an average outflow of 900 cusecs, which is the largest for any other rivers in Balochistan (Verheijen, 1998).

The area has an outstanding importance as it supports mangroves, marine cetaceans and a variety of birds and other important marine fauna. Miani Hor has been designated as the Ramsar site *i.e.* Wetland of International Importance. It is also included in WWF Global 200 Eco-regions, being an area of global significance and is a part of Ecoregion # 232 - Arabian Sea. The field data present in this study is accumulation of the observations on birds taken during October 1997 to June 2002.

The detailed studies on the avifauna of Miani Hor have not been conducted. Roberts (1991-92) has described the birds of Pakistan but there is no particular mention of Miani Hor. Karim, (1988) described the Avifauna of Sindh mangroves only. Ahmad *et. al.*, (1992) described water birds of Makran coast in general. Ahmed *et. al.*, (1999) have given a list of birds occurring in mangroves of Pakistan. Scott (1989) has described Miani Hor as an important wetland. Ghalib and Hasnain, (1997) have also given a list of birds distributed in mangroves of Balochistan but they did not indicate the distribution of birds for Miani Hor in particular. Ghalib *et. al.*, (2004) listed 380 species of birds from Balochistan.

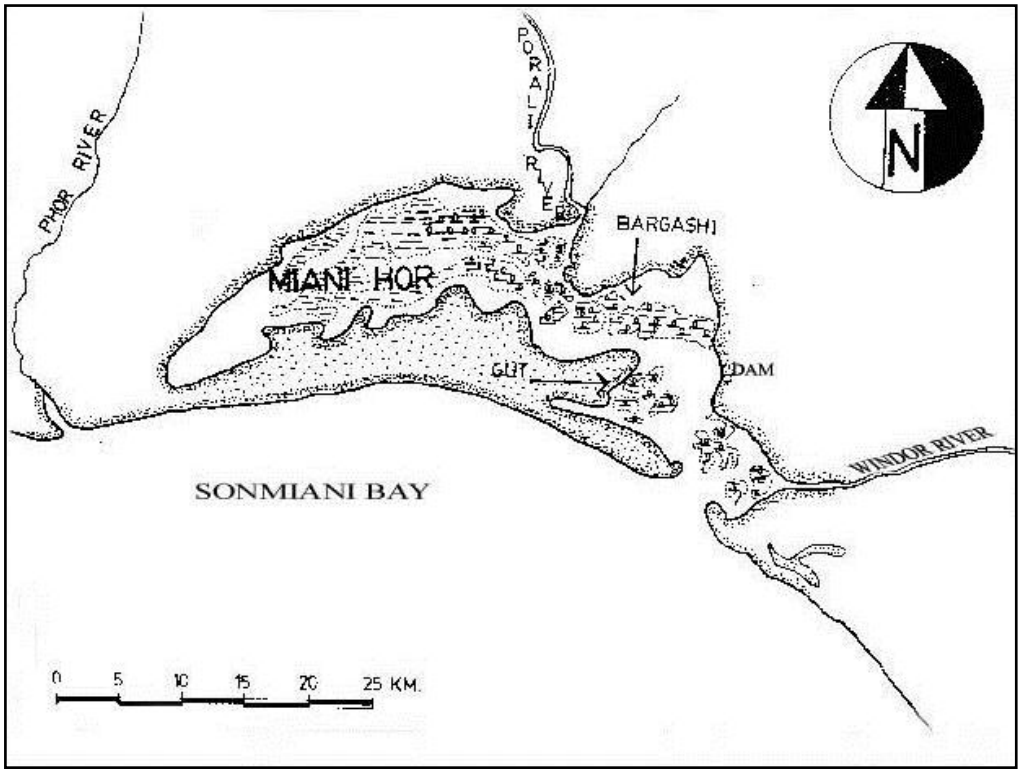

Fig 1. Miani Hor map showing the three observation sites.

MATERIALS AND METHODS

Miani Hor (Fig. 1) was divided into three sub-habitat i.e. Open mudflats near Winder river mouth (Site1), mangrove forests and its adjoining channels (Site 2) and the tail end of the Hor (Site 3). The open mudflat (Site 1) is flooded with tidal water twice a day. The area is mostly muddy and it receives fresh water from the Winder River during the monsoon season. The saltbushes such as *Arthocnemum indicum*, *Suaeda fruticosa*, and *Salsola* spp. are present here. Among trees and shrubs *Prosopis juliflora*, *Prosopis cineraria*, *Tamarix aphylla* and *Tamarix indica* also occurs in good numbers. A few mangrove trees of *Avicennia marina* are also present in the intertidal areas. In Site 2, there is large mangrove forest cover and the adjoining channels have mud flats which are exposed during low tide Three species of mangroves viz. *Avicennia marina*, *Ceriops tagal* and *Rhizophora mucronata* are present here. The tail end of the Miani Hor (Site 3) consists of sand flats and the main vegetation present here is *Arthocnemum indicum*, *Suaeda fruticosa*, *Salsola* spp and *Tamarix* spp. A few dwarf mangrove forest of *Avicennia marina* is also present.

The study areas were visited at least once every month from October 1997 to June 2002, for observation on avifauna. The birds were observed and identified using binoculars and spotting scopes. The identifications in the field were carried out with the help of Heinzel *et al*., (1972), Sonobe and Usui, (1993) and Grimmett *et al.,* (1998).

Table 1. Birds Distribution and Population at Miani Hor.

Order	Family	Common Name	Scientific Name	Status	Means of the Site wise count during Oct 1997 to June 2002			Total
					1	2	3	
Podicepidiformes	Podicipedidae	Little Grebe	*Tachybaptus ruficollis*	Wv	--	369	--	**369**
Pelecaniformes	Pelecanidae	Great White Pelecan	*Pelecanus onocrotalus*	Wv	153	93	240	**486**
	Phalacrocoracidae	Large Cormorant	*Phalacrocorax carbo*	Wv	43	698	--	**741**
		Indian Shag	*Phalacrocorax fuscicollis*	Wv	20	545	--	**565**
Ciconiiformes	Ardeidae	Grey Heron	*Ardea cineria*	Wv/ PM/ R	20	125	42	**187**
		Pond Heron	*Ardeola grayii*	R	46	196	12	**254**
		Large Egret	*Egretta alba*	R	19	58	25	**102**
		Median Egret	*Egretta intermedia*	R	69	79	42	**190**
		Little Egret	*Egretta garzetta*	R	64	88	22	**174**
		Reef Heron	*Egretta gularis*	R	39	170	55	**264**
	Threskiornithidae	Spoonbill	*Platalea leucorodia*	Wv	89	--	73	**162**
	Phoenicopteridae	Greater Flamingo	*Phoenicopterus ruber*	YRV/R	344	156	339	**839**
Gruiformes	Gruidae	Common Crane	*Grus grus*	PM	520	48	566	**1134**
		Demoiselle Crane	*Anthropoides virgo*	PM	90	--	100	**190**
Charadriiformes	Haematopodidae	Oysterctcher	*Haematopus ostralegus*	Wv	120	576	98	**794**
	Recurvirostridae	Blackwinged Stilt	*Himantopus himantopus*	R	139	350	225	**714**
		Avocet	*Recurvirostra avosetta*	Wv	43	--	--	**43**
	Charadriidae	Red-wattled Lapwing	*Vanellus indicus*	R	29	40	38	**107**
		Grey Plover	*Pluvialis squatarola*	Wv	350	484	190	**1024**
		Ringed Plover	*Charadrius hiaticula*	Wv	188	325	165	**678**
		Little Ringed Plover	*Charadrius dubius*	Wv	335	505	--	**840**
		Kentish Plover	*Charadrius alexandrinus*	Wv	166	703	48	**917**
		Mongolian Plover	*Charadrius mongolus*	Wv	195	311	--	**506**
		Greater Sand Plover	*Charadrius leschenaultii*	Wv	175	432	50	**657**
	Scolopacidae	Black tailed Godwit	*Limosa limosa*	Wv	288	345	201	**834**
		Whimbrel	*Numenius phaeopus*	Wv	31	200	95	**326**
		Curlew	*Numenius arquata*	Wv	72	96	47	**215**
		Common Redshank	*Tringa totanus*	Wv	145	300	173	**618**

Table 1 Cont'd…

Order	Family	Common Name	Scientific Name	Status	Means of the Site wise count during Oct 1997 to June 2002			Total
					1	2	3	
		Greenshank	*Tringa nebularia*	Wv	332	431	220	**983**
		Terek Sandpiper	*Xenus cinerius*	Wv	231	152	--	**383**
		Common Sandpiper	*Actitis hypoleucos*	Wv	140	312	83	**535**
		Ruddy Turnstone	*Arenaria interpres*	Wv	84	191	--	**275**
		Great Knot	*Calidris tenuirostris*	Wv	53	96	32	**181**
		Sanderling	*Calidris alba*	Wv	45	119	53	**217**
		Little Stint	*Calidris minuta*	Wv	79	300	68	**447**
		Temminck's Stint	*Calidris temminckii*	Wv	83	141	70	**294**
		Dunlin	*Calidris alpina*	Wv	49	213	57	**319**
		Curlew Sandpiper	*Calidris ferruginea*	Wv	236	152	85	**473**
	Laridae	Sooty Gull	*Larus hemprichii*	Wv	--	339	--	**339**
		Herring Gull	*Larus argentatus*	Wv	--	501	--	**501**
		Lesser Black backed Gull	*Larus fuscus*	Wv	--	438	--	**438**
		Great Black headed Gull	*Larus ichthyaetus*	Wv	10	311	--	**321**
		Black headed Gull	*Larus ridibundus*	Wv	7	281	--	**288**
		Slenderbilled Gull	*Larus genei*	Wv	--	115	--	**115**
	Sternidae	Caspian Tern	*Hydroprogne caspia*	R	15	90	--	**105**
		Common Tern	*Sterna hirundo*	SV	55	85	17	**157**
		Little Tern	*Sterna albifrons*	R	28	193	--	**221**
		Sandwich Tern	*Thalasseus sandvicensis*	YRV	--	86	--	**86**
Falconiformes	Accipitridae	Black Kite	*Milvus migrans*	R	10	5	--	**15**
		Brahminy Kite	*Haliastur indus*	R	--	49	--	**49**
		Shikra	*Accipiter badius*	R	5	8	--	**13**
		Common Buzzard	*Buteo buteo*	R/Wv	--	--	65	**65**
		Steppe Eagle	*Aquila rapax*	Wv	--	10	--	**10**
		Egyptian Vulture	*Neophron percnopterus*	R	--	--	3	**3**
		Marsh Harrier	*Circus aeruginosus*	Wv	--	9	--	**9**
	Pandionidae	Osprey	*Pandion halietus*	Wv	--	--	35	**35**

Table 1 Cont'd…

Order	Family	Common Name	Scientific Name	Status	Means of the Site wise count during Oct 1997 to June 2002			Total
					1	2	3	
	Falconidae	Peregrine Falcon	*Falco peregrinus*	Wv	3	--	7	**10**
Galliformes	Phasianidae	Grey Partridge	*Francolinus pondicerianus*	R	49	--	20	**69**
Columbiformes	Pteroclididae	Pintailed Sandgrouse	*Pterocles alchata*	Wv/R	--	--	42	**42**
	Columbidae	Collared Dove	*Streptopelia decaocto*	R	212	10	--	**222**
Coraciiformes	Alcedinidae	White-breasted Kingfisher	*Halcyon smyrnensis*	R	10	89	--	**99**
	Meropidae	European Bee-eater	*Merops orientalis*	R	--	55	--	**55**
Passeriformes	Alaudidae	Crested Lark	*Galerida cristata*	R	35	10	9	**54**
		Desert Lark	*Ammomanes deserti*	R	41	--	17	**58**
	Hirundinidae	Plain Sand Martin	*Riparia paludicola*	R	--	--	30	**30**
		Eurasian Barn Swallow	*Hirundo rustica*	R/Wv	45	--	--	**45**
	Passeridae	House Sparrow	*Passer domesticus*	R	315	--	--	**315**
	Sturnidae	Common Starling	*Sturnus vulgaris*	R	95	111	--	**206**
	Dicruridae	Black Drongo	*Dicrurus macrocercus*	R	25	25	10	**60**
	Corvidae	Common Crow	*Corvus splendens*	R	403	10	--	**413**
				Total	**6,487**	**12,229**	**3,769**	**22,485**

Wv = Winter visitor, SV = Summer visitor, R = Resident, PM = Passage Migrant, YRV = Year Round Visitor.

RESULTS AND DISCUSSION

A total of 70 species of birds belonging to 10 orders and 27 families were recorded during the study period (Table 1). Majority of the avifauna observed in the area are waterbirds (48 species). Among them 37 species of waterbirds are migratory. The migratory birds usually start arriving in the area in late August and depart by the end of April. The small passerines arrive first in the area in late August and then followed by the plovers in late September. The mean of the total number of birds counted at the Miani Hor during 1997 - 2002 is 22,485. Out of which 6,487 (28.85%) of the birds were observed at the Site 1 (mudflats of the Winder river mouth), 12,229 (54.38 %) at the site 2 (mangrove forests and adjoining channels) and 3,769 (16.76%) at the site 3 (tail end of the Hor) (Table 2). Among the birds 52.85 % winter visitor 1.42 % summer visitor, 38.57 % resident, 4.28 % passage migrant, and 2.85 % year round visitor (Table 3). The presence of the significant percentage of the winter visitor made the Miani Hor as one of the important coastal wetlands.

The open mudflats near Winder River mouth (Site 1) are intermixed with two localized ecological settings. The Winder River ends up at this site and deposits significant amount of

silt and sediments during the rainy seasons otherwise it remains dry giving the look of the river of sand (Hussain, 1988). *Prosopis juliflora* vegetation dominates the dry riverbed and majority of the passeriformes were noted here. This includes Crested and Desert Larks, Barn Swallow, House Sparrow, Common Starling and Black Drongo. Among raptors, Shikra and Peregrine Falcon were recorded. Shikra was once spotted having the house sparrow in its claw. During low tide this area serves as ideal feeding ground for the waders. The Cranes, which are passage migrants, have been seen in this area. Their special vocal sounds can be heard during the month of November when they pass through Miani Hor to further east and in the month of February when they again pass through this site on their way back toward west. Usually they remain at this site for two to three days and migrate from this place in the early morning or in the late evening and their high pitch sounds attract passerby while they fly. Flamingoes use this area as feeding ground and they can be observed throughout the year.

Table 2. Total number of birds at each site and their respective population percentage during October 1997 to June 2002.

Site	No of Birds	Percentage % of population
1.	6,487	28.85
2.	12,229	54.38
3.	3,769	16.76

The mangrove swamps and adjacent channels (Site 2) form comparatively large area and have significant mangrove cover of the three species viz. *Avicennia marina*, *Ceriops tagal* and *Rhizophora mucronata*. It provides an ideal habitat for the avifauna. During low tide, the open mudflats and sandflats provide extensive food for the birds. Oystercatchers, Plovers and the Scolopacids (Eurasian Curlew, Whimbrel, Godwit, Redshank, Greenshank, Turnstone, Little Stint, Dunlin and Curlew Sandpiper) are commonly observed on the edges of the mud flats searching for food that includes the annelids, polychaetes, molluscs and variety of other meiofauna during the low tide. Inside the deep meandering channels of the mangrove forest, Cormorants and Indian Shags are observed perching on mangrove trees close to the channel or searching food. Cormorants are fish eating bird and usually dive for fish during swimming. While roosting on the mangroves, they spread their feathers and giving a look of "sadhoo" – a saint sitting quietly. Sanderling, though uncommon were observed in mixed flocks with other waders. It is also recognized by its behavior of running to the edge of water with receding waves.

Another fish eating bird, Kingfisher - sitting on the mangrove branches, bows down near the tidal waters waiting to catch the fish swimming around these branches for food. Egrets and Herons use the soft mud of the mangroves after receding of the tidal water to find out the crustaceans, mollusks and small juvenile fish. Gulls and Terns were observed flying over the mangrove channel regularly. Gulls and Terns were common in the area. Terns are one of the best divers when they spot fish in the water. Gulls are opportunistic and most of the gulls could be seen flying around the fishing boats from where they can catch the fish. They also feed on the trash fish, which are usually spread at the open places for drying. A few nests of Brahminy Kites and Little Egrets were found on mangrove trees.

The tail end of the Hor (Site 3) is marked with dwarf mangrove forest of the *A. marina* with sand flats. The other vegetation is *Arthocnemum* spp. and *Tamarix* spp. Common and Demoiselle Cranes use this area as staging ground during migration. Besides waders, pelicans, ardeids, spoonbill, flamingoes, gulls and terns were common at this site. Among raptors, Common Buzzard and Osprey were recorded, while once Egyptian Vulture was also observed in this area.

The numbers of birds are significant at site 2, because the area provides lot of food material available in the mudflats of the mangroves in the form of annelids, crustaceans etc. French, 1996 also observed good number of birds while working in the mangrove areas of the Trinidad.

Table 3. Percentage of the birds cited at the Miani Hor according to their category.

S. No	Category	Percentage %
1.	Winter visitor	52.85
2.	Summer visitor	1.42
3.	Resident	38.57
4.	Passage migrant	4.28
5.	Year Round Visitor	2.85

The other two sites, which have fewer numbers of birds, but have their own importance. Cranes use both the sites during their migration. Flamingoes have been observed nesting at site 3 which makes it ecologically more important. The evidences of breeding of Greater Flamingo were recorded from the mudflats in this area. They make mound of mud for egg laying. The breeding took place between May and August when the sea was rough and it became difficult to visit the area. Proportionally site 2, which is flourishing with mangrove vegetation, has more percentage of birds than other two sites but ecologically all of them are important.

In Miani Hor, Oystercatcher is observed in abundance during the months of December and January while their population declines after March. Common and Demoiselle Cranes use the area as passage migrant and stay here for about a week mainly at Site 1 and 3. Pelicans arrive in the month of September and stay till the end of March. Great Knot is uncommon and occasionally observed in inter-tidal mudflats and estuaries.

The most common land birds observed on offshore mangrove forest in Miani Hor are the Crested Lark and Desert Lark. They are observed throughout the year but in small numbers. Both species are insectivorous. Crested Lark typically feeds by gleaning insects from leaves in the outer canopy, and the Desert Lark feeds in the mid canopy. They both are also observed on the high tidal mark from where they catch insects coming with tidal waters. The other birds that can be observed throughout the year are the Flamingoes, Egrets, Red Wattled Lapwing, Little Tern, Brahminy Kite, Kingfisher, Bee-eater, Sand Martin, and Black Drongo. Median and Large Egrets though observed throughout the year do not nest here. Flamingo is a filter feeder and is observed in significant numbers in the inter-tidal areas. Pond Heron, Grey Heron, Large Egret, Median Egret are found in the canopies of the mangrove trees and feeding in adjacent shallow ponds. Among Raptors, Peregrine Falcon, Osprey, Steppe Eagle, Marsh Harrier, Common Buzzard and Shikra have been recorded. Black Kite and Brahminy Kite are also common. Many of these birds feed on the marine invertebrates, others on insects. Some inland bird species also use mangrove as refuges in drought conditions (Farnsworth and Ellison, 1997).

The subtropical lagoons like Miani Hor assume to have critical importance for the bird species as here these types of wetlands occur as isolated discrete stands (Saifullah and Rasool, 2002). In contrast, in tropical regions mangroves and associated wetlands often occur as wide bands along estuaries (Hutchings and Recher, 1983). Though Miani Hor has significant value in respect of its bird population but it is under severe pressure. Hunting of the birds is common in the area. It causes a great deal of disturbance to bird population. Curlews, cormorants and flamingoes are hunted for meat while Pelicans are hunted for extraction of oil from their fat. The oil is used by the local Tabibs (Herbal Practitioners) for treatment of rheumatic patients. Cranes are killed to obtain its bones. The locals crush the bones of cranes into powder after consuming its meat as food, use these crushed bones for curing the patient suffering from kidney problems. The juveniles of the birds are also captured to make them domesticated. Cutting of mangroves and over fishing in the Hor is the major causes of degradation of the birds' habitat.

There is a need for immediate action to conserve this ecologically important bird habitat. Integrated approach should be adopted to protect species and habitat. It will contribute to the conservation of biodiversity of the site including birds. The local communities may be involved in conservation and management. The community based management practices would reduce the

pressure on birds and their habitat. Though Miani Hor is a wetland of international importance being a Ramsar site but it has no protection status. The site may be declared as a Wildlife Sanctuary.

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(Received on 24th August, 2007)